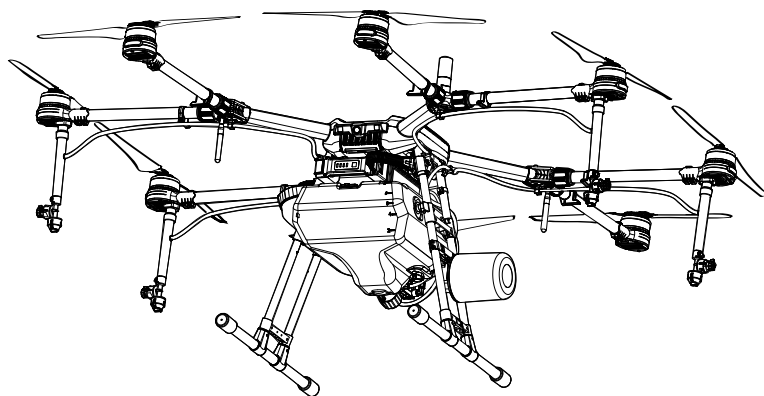


# AGRAS MG-1P SERIES

## MG-1P / MG-1P RTK

User Manual V1.0

2018.11



### **Searching for Keywords**

Search for keywords such as “battery” and “install” to find a topic. If you are using Adobe Acrobat Reader to read this document, press Ctrl+F on Windows or Command+F on Mac to begin a search.

### **Navigating to a Topic**

View a complete list of topics in the table of contents. Click on a topic to navigate to that section.

### **Printing this Document**

This document supports high resolution printing.

## Information

1. The AGRAS™ MG-1P / MG-1P RTK does not come with a flight battery. Please purchase the DJI™ Designated Battery (Model: MG-12000P). Read the battery's safety guidelines and take necessary precautions when handling to ensure your own safety. DJI assumes no liability for damage(s) or injuries incurred directly or indirectly from misusing batteries.
2. In this manual, the altitude limit of 30 meters (the altitude limit can be adjusted in the app) means the altitude between the aircraft and the surface of the objects below it when the altitude stabilization function of the radar module is enabled. If the function is disabled, the altitude limit means the altitude between the aircraft and the takeoff point.

## Using This Manual

### Legend

 Important

 Hints and tips

 Reference

### Before Flight

The following manuals have been produced to help you get the most out of your AGRAS MG-1P / MG-1P RTK:

1. In the Box
2. Disclaimer and Safety Guidelines
3. Quick Start Guide
4. User Manual

Refer to In the Box to check the listed parts, and read the Disclaimer and Safety Guidelines before flight. Refer to the Quick Start Guide to complete assembly and to learn basic operation. Please refer to the User Manual for more comprehensive information.

### Watch the Tutorial Videos

Please watch the tutorial videos at the link below, which demonstrates how to use the MG-1P / MG-1P RTK safely: <http://www.dji.com/mg-1p/info#video>



### Download DJI Assistant 2 for MG

Download DJI ASSISTANT™ 2 for MG from:  
<http://www.dji.com/mg-1p/info#downloads>

# Safety at a Glance

## 1. Pesticide Usage

- Avoid the use of powder pesticides as much as possible or else they may reduce the service life of the spraying system.
- Pesticides are poisonous and pose serious risks to human safety. Please use them in strict accordance with their specifications.
- Residue on the equipment caused by splashes or spills when pouring and mixing the pesticide can irritate your skin. Be sure to clean the equipment after mixing.
- Use clean water to mix the pesticide to avoid blocking the strainer. Clear any blockages before using the equipment.
- Wear protective clothing to prevent direct body contact with the pesticide. Always rinse your hands and skin after handling pesticides. Clean the aircraft and remote controller after applying the pesticide.
- Effective use of pesticides relies on pesticide density, spray rate, spray distance, aircraft speed, wind speed and wind direction. Consider all factors when using pesticides, but NEVER compromise the safety of people, animals and the environment in doing so.
- DO NOT contaminate rivers and sources of drinking water.



The Agras MG-1P / Agras MG-1P RTK (abbreviated as "MG-1P" / "MG-1P RTK") aircraft is NOT a toy and is not suitable for children under the age of 18.

**Note that 'Safety at a Glance' only provides a quick overview of the safety tips. Make sure you read and understand the remaining sections of this document and the User Manual.**

## 2. Environmental Considerations

- Always fly at locations that are clear of building and other obstacles.
- DO NOT fly above or near large crowds.
- Avoid flying at altitudes above 98 feet (30 m).
- Be very careful when flying over 6,560 feet (2,000 m) above sea level.
- Fly in moderate weather conditions with temperatures between 32° to 104° F (0° to 40° C).
- Ensure that your operations do not violate any applicable laws or regulations, and that you have obtained all appropriate prior authorizations. Consult the relevant government agency or authority, or your lawyer before flight to ensure you comply with all relevant laws and regulations.
- DO NOT operate any parts of the aircraft indoors.

## 3. Pre-flight Checklist

- Remote controller and aircraft batteries are fully charged.
- Landing gear and spray tank are firmly in place.
- All screws are firmly tightened.
- Propellers and frame arms are unfolded, and arm sleeves are firmly tightened.
- Propellers are in good condition and firmly tightened.
- There is nothing obstructing the motors.



- Spraying system is without any blockage and works properly.
- Compass is calibrated at every new flight location.

#### 4. Operation

- Stay away from the rotating propellers and motors.
- The takeoff weight must not exceed 24.8 kg (taking off at sea level).
- Maintain a visual line of sight (VLOS) to your aircraft at all times.
- DO NOT use the Combination Stick Command (CSC) or other methods to stop the motors when the aircraft is airborne unless in an emergency situation.
- DO NOT answer incoming calls during flight.
- DO NOT fly under the influence of alcohol or drugs.
- During the Return to Home procedure, if the operating environment is not suitable for the radar module to work properly, the aircraft will not be able to avoid obstacles. You can adjust the flight speed and altitude to avoid obstacles if the remote controller is connected to the aircraft.
- In the instance of a Low Battery Warning, land the aircraft at a safe location.
- After landing, first stop the motors, then power off the aircraft, and then turn off the remote controller. Otherwise, the aircraft may enter Failsafe RTH automatically due to remote controller signal loss.
- Please maintain full control of the aircraft at all times and do not rely on the DJI MG app. The obstacle avoidance function is disabled in certain situations. Please keep the aircraft within your visual line of sight and visually observe the flight. Please use your sound discretion to operate the aircraft and avoid obstacles timely and manually. It is important to set an appropriate Failsafe and Return to Home altitude before each flight.

#### 5. Maintenance and Upkeep

- DO NOT use aged, chipped or broken propellers.
- Remove or empty the spray tank during transportation or when not in use to avoid damaging the landing gear.
- Recommended storage temperature (empty spray tank): between -4° and 104° F (-20° and 40° C).
- Clean the aircraft immediately after spraying.
- Inspect the aircraft every 100 flights or after flying for over 20 hours.
- For more maintenance guidelines, refer to the Product Care section in this document.

#### 6. Observe Local Laws and Regulations

- You can find a list of DJI GEO Zones at <http://www.dji.com/flysafe>.
- The DJI GEO Zones is not a replacement for local government regulations or good judgment.
- Avoid flying in areas where rescue teams are actively using the airspace.



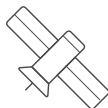
Fly in Open Areas

+



Calibrate the  
Compass

+



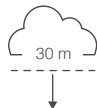
Strong GNSS Signal

+

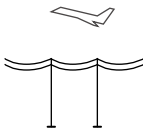


VLOS

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Fly Below  
98 feet (30 m)

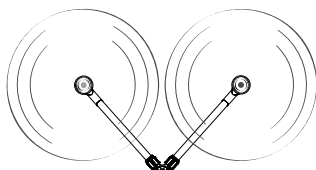


Avoid flying over or near crowds, high voltage power lines or bodies of water.

Strong electromagnetic sources such as power lines, base stations, and tall buildings may affect the onboard compass. It is recommended to use MG-1P RTK. Always stay alert about surroundings in flight.



DO NOT use the aircraft in adverse weather conditions such as rain (precipitation rate exceeding 25 mm or 0.98 inches in 12 hours), wind speeds exceeding 8 m/s or 17 mph (28 kph), fog, snow, and lightning.



Stay away from the rotating  
propellers and motors.



GEO Zones

Learn more at:  
<https://www.dji.com/flysafe>

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# Product Profile

## Introduction

The Agras MG-1P series (MG-1P / MG-1P RTK) aircraft are equipped with a wide-angle First Person View (FPV) camera which enables observation of the landscape in front of the aircraft, allowing operation areas to be identified and enabling pilots to avoid obstacles. Its second generation high-precision radar with integrated obstacle avoidance radar module and forward, backward, and downward altitude stabilization radar modules provides improved obstacle sensing and terrain following capabilities. The quality of the aircraft's industrial design and materials make it dust-proof, water-proof (IP43 protection rating, IEC standard 60529), and corrosion-resistant. The MG-1P and MG-1P RTK utilize DJI's dedicated A3 flight control system with eight-rotor propulsion redundancy, ensuring safe and stable operation at all times. The MG-1P RTK has a built-in DJI Onboard D-RTK™, which provides more accurate data for centimeter-level positioning\*.

The remote controller uses the DJI OCUSSYNC™ dual-band video downlink system, has a maximum control distance of up to 3.11 mi (5 km)\*, and is equipped with a bright, dedicated screen with the DJI MG app built-in. Operation planning can be performed either using the remote controller only or by flying the aircraft to waypoints. The Banked Turning feature in the DJI MG app commands the aircraft to take corners without fully stopping, making flight operations more flexible and efficient. The remote controller's Multi-Aircraft Control mode can be used to coordinate the operation of up to five aircraft at the same time, enabling pilots to work very efficiently. Replaceable batteries make it easy to use the remote controller every day and removable antennas make maintenance easier.

## Feature Highlights

The MG-1P / MG-1P RTK uses a DJI dedicated flight control system, providing four operation modes: Route, A-B Route, Manual, and Manual Plus.

The DJI MG app automatically produces flight routes based on your planned fields. Plan a field by walking with the remote controller or by flying the aircraft to waypoints. To start, simply select the field from the field list.

In A-B Route operation mode, the aircraft will travel along a pre-planned route and spray its liquid payload. Users can set the line spacing, flying speed, and other parameters.

In Manual operation mode, users can start and stop spraying manually and also adjust the spray rate.

In Manual Plus operation mode, flight speed is restricted and heading is locked. Except for the heading, users can control the aircraft's movement via control sticks. Press button C1/C2 on the remote controller or the corresponding button in the app and the aircraft will fly one line spacing to the left/right. (This is the default function for button C1 and button C2. They are customizable in the app.)

The MG-1P / MG-1P RTK also includes the Operation Resumption function. When pausing the operation in Route or A-B Route operation mode, Operation Resumption records a breakpoint for the aircraft. Users can resume from the return point when continuing the operation.

\* This should be used with a DJI approved Network RTK service or a DJI D-RTK 2 GNSS High-Precision Mobile Station (sold separately). Refer to RTK Functions (p. 43) for details.

The remote controller is able to reach its maximum transmission distance (FCC: 3.11 mi (5 km); CE / KCC / MIC / SRRC: 1.86 mi (3 km)) in a wide open area with no electromagnetic interference, and at an altitude of about 8.2 ft (2.5 m).

The remote controller features Multi-Aircraft Control mode, which can be used to coordinate the operation of up to five aircraft simultaneously. Turn the Aircraft Control Switch Dial on the remote controller to switch control between the different aircraft.

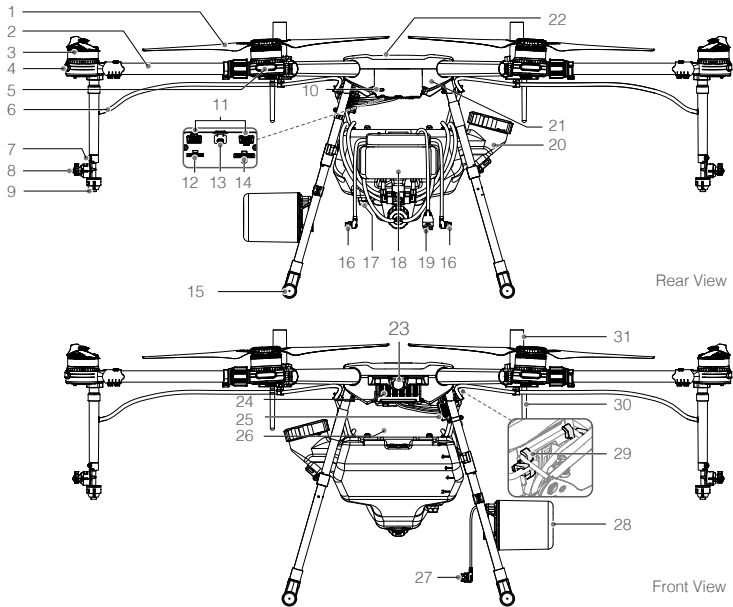
The second generation high-precision radar mode works automatically in Route, A-B Route, and Manual Plus operation mode. Altitude detection and stabilization functions are available in forward, backward, and downward directions while the obstacle avoidance function is available in forward or backward direction according to the direction of flight.

The spraying system includes a spray tank, liquid level meter, sprinklers, and other accessories. The four sprinklers placed on the aircraft's two sides provide evenly distributed spraying and coverage of the liquid payload. Optimized structures and algorithms of the spraying system for more precise spraying control and more effective leak and drip prevention.

The MG-1P RTK has a built-in DJI Onboard D-RTK, providing more accurate data for centimeter-level positioning when used with the DJI D-RTK 2 or Network RTK Service. An optional Handheld RTK or PC GS Pro is available for more precise field planning, enhancing the accuracy of agricultural operations.

Overview

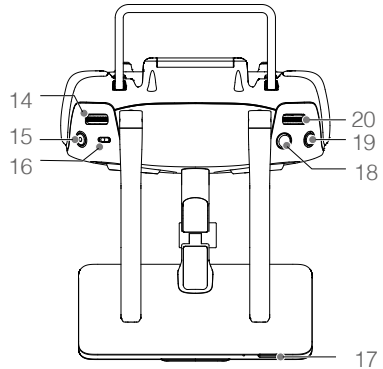
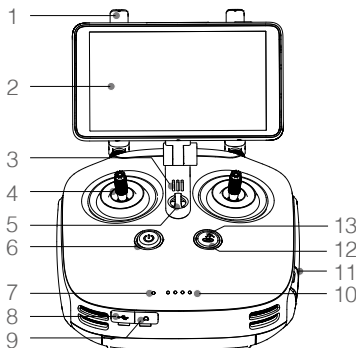
Aircraft



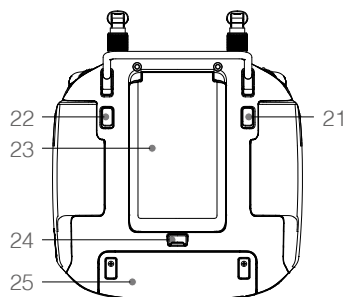
|   |                             |  |
|---|-----------------------------|--|
| 1 Propellers                                    | 11 Pump Ports               | 23 FPV Camera                                    |
| 2 Frame Arms                                    | 12 Radar Port               | 24 Intake Vent                                   |
| 3 Motors  | 13 Micro USB Port           | 25 Power Port                                    |
| 4 ESC LEDs<br>(on M1-M4 and M7-M8 arms)         | 14 Liquid Level Meter Port  | 26 Battery Compartment                           |
| 5 Aircraft Status Indicators<br>(on M5-M6 arms) | 15 Landing Gear             | 27 Radar Cable                                   |
| 6 Hoses   | 16 Pump Cables              | 28 Radar Module                                  |
| 7 Sprinklers                                    | 17 Liquid Level Meter       | 29 Remote Controller Holder                      |
| 8 Manual Relief Valve                           | 18 Delivery Pumps           | 30 OCUSYNCTM Dual-band<br>Antennas               |
| 9 Nozzles                                       | 19 Liquid Level Meter Cable | 31 Onboard D-RTK Antennas<br>(on MG-1P RTK only) |
| 10 Link Button                                  | 20 Spray Tank               |  |
|   | 21 Aircraft Body            |  |
|   | 22 GNSS Module              |  |

- ⚠** • DO NOT obstruct the GNSS module (located at the center of the aircraft), as doing so would reduce the GNSS signal strength.
- The MG-1P and MG-1P RTK do not come with a battery. Please purchase the DJI approved battery pack (Model: MG-12000P).

## Remote Controller



- Antennas**  
Relays aircraft control signals.
- Display Device**  
Android-based to run the DJI MG app.
- Speaker**  
Audio output.
- Control Sticks**  
Controls aircraft movement. Can be set to Mode 1, Mode 2, or a custom mode.
- Lanyard Attachment**  
Used to attach the remote controller lanyard.
- Power Button**  
Used to turn the remote controller on and off.
- Status LED**  
Indicates whether the remote controller is linked to the aircraft.
- USB-C Port**  
Connects to a computer via a USB-C cable for configuration. Connects to the aircraft via a USB-C OTG cable and a Micro USB cable for aircraft firmware update.



**9 3.5 mm Audio Jack**

Used to connect an audio input/output device.

**10 Battery Level LEDs**

Displays current battery level.

**11 MicroSD Card Slot**

Provides display device with up to 128 GB of extra storage.

**12 RTH Status LED**

Circular LED around the RTH button. Displays RTH status.

**13 RTH Button**

Press and hold this button to initiate Return to Home (RTH).

**14 Spray Rate Dial**

Turn to adjust the spray rate in Manual operation modes.

**15 Spray Button**

Press to start/stop spraying in Manual operation mode.

**16 Pause Switch**

Toggle to pause the operation in Route, A-B Route or Manual Plus operation modes. During RTH, toggle to pause RTH. The aircraft hovers, and then the aircraft can be controlled manually.

**17 Sleep/Wake Button**

Press to sleep/wake the screen; press and hold to restart.

**18 Button A**

Records Point A of the operation route in A-B Route operations by default. Use the app to customize the button.

**19 Button B**

Records Point B of the operation route in A-B Route operations by default. Use the app to customize the button.

**20 Aircraft Control Switch Dial**

Turn and press the dial to switch among the aircraft when using Multi-Aircraft Control function.

**21 Button C1**

When you are planning a field, it starts or ends obstacle measurement. When planning a field, the function cannot be customized. When you are not planning a field, the default function is Map/FPV Switch. Use the app to customize the button.

**22 Button C2**

When you are planning a field, it adds a waypoint. When planning a field, the function cannot be customized. When you are not planning a field, then the default function is Delete Route. Use the app to customize the button.

**23 Battery Compartment Cover**

Open the cover to mount or remove the Intelligent Battery from the remote controller.

**24 Battery Compartment Cover Lock**

Slide the lock down to open the cover.

**25 Dongle Compartment Cover**

Open the cover to mount or remove the dongle.



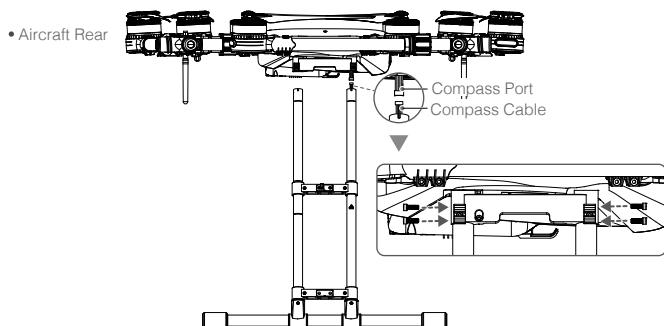
# Installation

- ⚠ • Threadlocker of medium strength is required for installation. Apply threadlocker when mounting the landing gear, power port module, spray tank, sprinklers, and radar module. Ensure the threadlocker is totally dry and solid before flight.
- DO NOT bend the hoses in an arc tighter than their minimum bend radius during installation. This is to avoid creasing, which may compromise the spraying effect.
- Ensure that all installation and connection procedures are completed before powering on the aircraft.

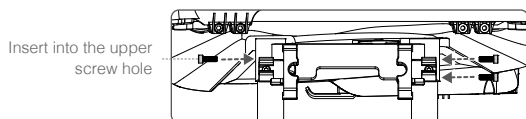
The installation steps are the same for both the MG-1P and MG-1P RTK. In the figures below the MG-1P is shown.

## Mounting the Landing Gear

1. Identify the landing gear leg containing the compass cable.
2. Take out the compass cable from the tube of the landing gear leg and connect it to the compass port on the aircraft's right side, then mount the right landing gear leg to the mounting position. Be careful not to damage the cable.
3. Secure the right landing gear leg in place using four M3×10 screws.

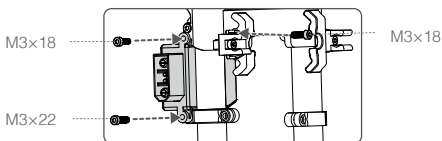


4. Mount the left landing gear leg and secure it in place using three M3×10 screws.



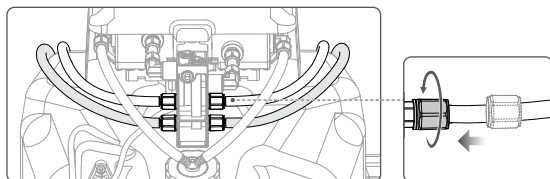
## Mounting the Power Port Module

Mount the power port module onto the left landing gear leg using two M3×18 screws and one M3×22 screw.

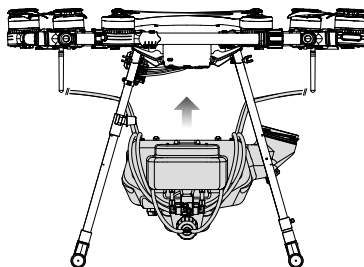


## Mounting the Spray Tank

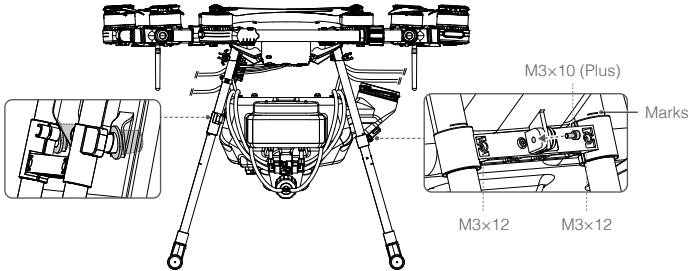
1. Connect the sprinkler kits to the spray tank: Pull the four hoses through the nuts to the outlets under the delivery pump, then tighten the nuts using a wrench. Note that the white and black hoses should be attached to outlets with labels of the same color. Be sure to securely tighten the nuts to avoid liquid leakage.



2. Remove the cover of the spray tank. Pull the hoses on both sides through the spaces between the two tubes of each landing gear leg with the mouth of the tank facing toward the right side of the aircraft.
3. Lift the spray tank and pull the mouth of the tank through the space between the two tubes of the right landing gear leg.



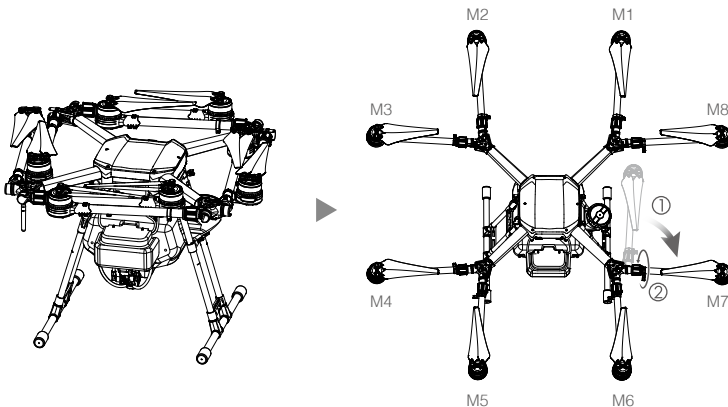
4. Insert the plugs on the left landing gear leg into the mounting holes on the spray tank.
5. Slide the fixing bracket on the right landing gear leg to the marks on the tubes to align the screw holes on the fixing bracket with the fin on the right side of the spray tank. Tighten the two M3×12 screws and insert and tighten one M3×10 (Plus) screw.



6. Connect the two pump cables and one liquid level meter cable to their corresponding ports on the aircraft body.

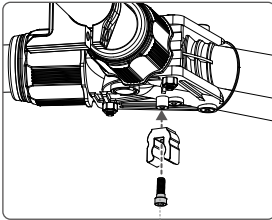
## Unfolding the Frame Arms

1. Unfold the frame arms ① and tighten the two arm sleeves at each of the junctions ②.
2. Identify the position and rotational direction of the motors. The top view shows motors M1 to M8 arranged in a counter-clockwise order, with motors M1 and M2 at the front of the aircraft, and motors M5 and M6 at the rear. Motors M1, M3, M5, and M7 rotate counter-clockwise as indicated by the "CCW" mark, while motors M2, M4, M6, and M8 rotate clockwise as indicated by the "CW" mark.

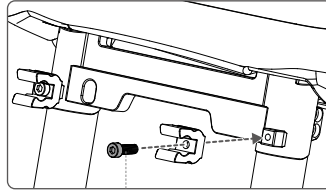


## Mounting the Sprinklers

1. Mount the hose clips: Mount one hose clip to the bottom of each of the four frame arm junctions using T3×10 screws. Mount one hose clip to the outside of the right landing gear leg mounting position using an M3×6 screw.

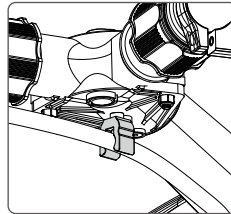
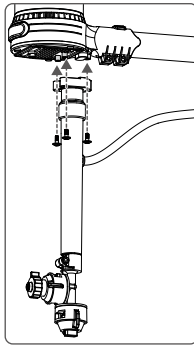


T3×10

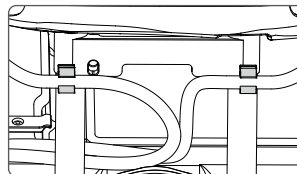
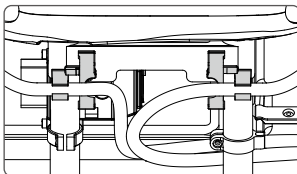


M3×6

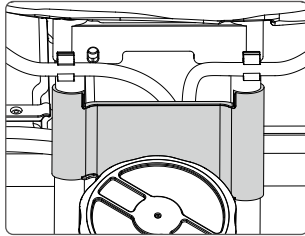
2. Mount the sprinklers with white hoses under motors M3 and M8 (with white circle marks). Mount the sprinklers with black hoses under motors M4 and M7 (with black circle marks). Mount each of the four sprinklers using three M3×8 (Plus) screws, then insert the hoses into the clips at the bottom of the frame arm junctions. Be sure to mount the sprinklers to the mounting holes nearer to the inside of the aircraft, with the hoses facing the frame arm.



3. Insert the hoses on both sides into the clips on the landing gear.

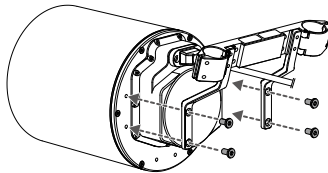


4. Mount the fender to the right landing gear leg to avoid spills when pouring liquids. Handle with care to avoid damage to the fender.

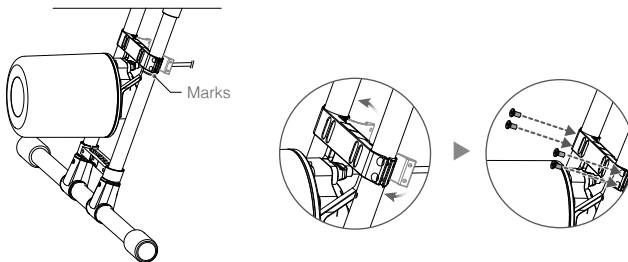


## Mounting the Radar Module

1. Mount the radar bracket to the radar module using four M3x5.5 screws, with the bracket crossbar over the radar cable as shown in the figure below.



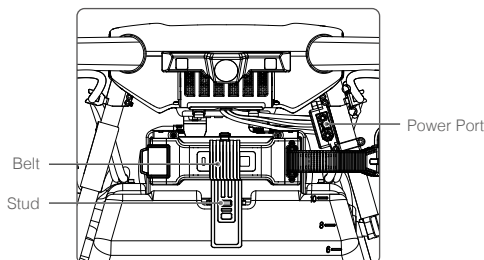
2. Unfasten the buckles on the bracket then mount it to the left landing gear leg. Align the bracket to the lower marks on the landing gear leg. Fasten the buckles and secure them using four M3x5.5 screws.



3. Insert the radar cable into the cable clip on the landing gear leg, then connect it to the radar port on the aircraft body.

## Mounting the Flight Battery

Insert the battery into the battery compartment from the front of the aircraft. Ensure the battery is securely mounted and then fasten the belt to the stud on the spray tank.

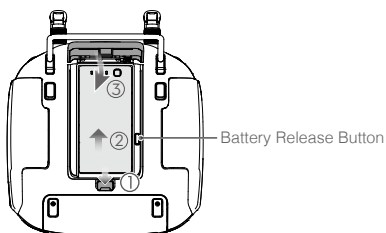


- ⚠ • The MG-1P and MG-1P RTK do not come with a battery. Please purchase the DJI approved MG-1P battery pack (Model: MG-12000P).
- The voltage on the aircraft can reach 50.4 V. Read the battery's safety guidelines and take necessary precautions when handling the battery to ensure your own safety.

## Mounting the Remote Controller Battery

The remote controller uses a removable, interchangeable Intelligent Battery making long-term operation easy.

Slide the battery compartment cover lock on the back of the remote controller down to open the cover ①, insert the Intelligent Battery into the compartment and push it to the top ②, then close the cover ③.



- 💡 To remove the Intelligent Battery, open the cover, press and hold the battery release button, then push the battery downward.